



Independent Confirmation Assessment Team

Summary Status Presentation to the

GSEC PMC
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Vern Weyers
Chair

NOTE: This copy has been altered and is not complete.

ICA Team

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Descope Features

Feature	Phase B Baseline	Phase B Descope	Proposed Phase C/D
Sun Angle	45 deg	35 deg	35 deg
No. of CCD's	24	13	13
Sun Shield	225" Deployable	108" Fixed	108" Fixed
Hydrazine Tank	31" w/ Integ. Pressurization	19" w/ Sep. Pressurization	31" w/ Integ. Pressurization
AKM	STAR 37	STAR 30	STAR 37
Delta ELV	7925-10	7425-10	7925-10
Sci. Data Processing	Instrument Processor	S/C Processor	S/C Processor

Summary of the FAME Science Evaluation

- **The October 2001 PDR De-Scope of FAME Will NOT Have a Major Impact on the Science Return of the Mission Astrometry and Photometry as Described in the June 1999 CSR**
 - » The Reduced Single-Measurement Accuracy Is Recovered By Doubling the Mission Lifetime to 5 years
 - » A Key Element of the Program is the Large Number of Stars to be Observed, and This is Retained
- **The Most Regrettable Aspect of the PDR De-Scope is the Reduction to Only Two Photometric Bands**
 - » Will Require Additional Ground-Based Observations for Some Programs, the Accuracy of Which Will Be Less and the Availability is Uncertain
 - » This Descope Will Adversely Impact the Long-Term Legacy of FAME

Remaining Science Concerns

- **Can the New Cassegrain Optical System Provide the Required Image Quality to Support Centroiding At the 1/350 Pixel Level?**
- **Can It Be Demonstrated That the Instrument CCD Detector Design is Sufficiently Robust Against Radiation Damage to Support a 5-Year Mission Lifetime?**
- **Can the Manufacturer (SITE) Deliver CCDs of Sufficient Quality to Support the Astrometry and Photometry?**

Schedule

- **Overall Findings**
 - » **Schedule Risk for FAME Launch Readiness on 10/30/04 is **HIGH** Due to “Just-in-Time” (No Planned Schedule Reserve) Instrument Delivery from Lockheed**
 - » **Spacecraft and Instrument Schedules are Comprehensive and Integrated - but Need Further Refinement to Verify that Descope has been Fully Integrated**
 - » **113 Calendar Days of Planned Schedule Reserve (at Spacecraft Level) is Consistent with Explorer Program Planning Standard - But is Insufficient Due to Instrument Schedule Uncertainties**
 - 99 Days Prior to Completion of I&T at NRL
 - 14 Days in Launch Flow Prior to Handover to ELV Team

Assessment of Alternate Plan

- **Implementation of the Alternate Plan Should Greatly Mitigate the Most Serious Risk Areas**
 - » CCD Development
 - » Instrument Optical Bench Development
- **Would Delay Launch by Estimated 10 - 12 Months**
- **Impacts Total Program Cost**
 - » Amount Depends on Risk Reductions and Success in Significantly Downsizing Team and Recapturing Key Personnel Later
 - » Science Would Still be Descoped
 - » Launch Costs May Need to be Renegotiated
 - » Impact to NASA Dependent On Success In Obtaining Timely Non-NASA Supplemental Funding

Conclusions (1 of 3)

- **Science**

- » Descoped FAME Mission is Still a Very Attractive Science Mission
- » Requires Both the Spacecraft and Instrument To Perform Adequately For Five Years
- » Will Require Increased Ground Processing of Science Data Due to Only Two Photometric Bands

- **Management and System Engineering**

- » NRL Team is Experienced and Competent
- » Requirements Are Well Defined and Documented
- » Rescope Activity Just Prior to PDR Caused Significant Impact. Proposed Phase C/D Baseline is Appropriate

- **Spacecraft**

- » Complex and Challenging Requirements
- » Lack of Extensive Redundancy Modestly Increases Technical Risk
- » Low Power Margin is a Remaining Concern
- » Schedule/Cost Risk is **LOW** to **MEDIUM**

Conclusions (2 of 3)

- **Instrument**

- » Design Should Meet All Requirements, But Design Maturity at End of Phase B is Very Low Because of the Recent Major Redesign
- » Instrument is on Program Critical Path and Has No Slack in Development Schedule
- » CCD Detector Yield Very Low to Date
- » Optical System Design Changed Significantly As Result of the Descope and Its Development is Incomplete
- » Cost Has Grown Significantly and Will Grow More
- » Overall Risk is **HIGH**, Primarily Due to Tight Schedule

- **MO&DA**

- » Planning and Progress Have Been Excellent During Phase B
- » Costs Have Grown Significantly and May Increase Further
- » Technical Risk is **LOW** to **MEDIUM**

Conclusions (3 of 3)

- **Schedule**

- » Current Schedule Reserves Are Inadequate, Primarily Due to Lack of any Slack in the Instrument Development Activity
- » Instrument Schedule Slack Can Be Increased, but With Attendant Cost Increases
- » Schedule Needs to be Refined to Assure That All Descope Implications Are Fully Integrated
- » Program Schedule Risk is **HIGH**

- **Cost**

- » The ICA Team Estimates Total Descoped FAME Runout Costs at Around

- **Alternate Program**

- » The Proposed Alternate Program Could Significantly Decrease Technical Risk
- » Impact on Overall Cost Dependent Upon Extent of Risk Reductions and Availability of Personnel Following Hiatus

Recommendations

- **If Affordable in FY 02, Proceed With Alternate Program**
 - » **Potential to Greatly Mitigate Risk**
 - » **Potential to Obtain Additional non-NASA Funding**
 - » **Establish Specific Success Criteria (e.g., Detectors in Hand, NASA Cost Projection)**
- **Reevaluate Situation Near End of FY 02**
 - » **Consider Remaining Risk, Schedule, Cost and Funding**
- **Proceed into Phase C/D or Cancel**
 - » **Reasonable Investment Which Could Save Good Science Mission**
 - » **Outside Funding is the Key**